By this Obſervation the Beginning differed not 2 $\frac{1}{2}$, and the End not $\frac{1}{2}$ a Minute from Dr. *Halley*'s Computation, which he ſent me the Day before. And if his Computation, which was made for *Greenwich*, had been reduced to the Meridian of *London*, the Difference would have been ſtill leſs.

The ſame Eclipſe was obſerv'd by Mr. Hawkins *at* Wakefield, *in* Yorkſhire, *to begin at* 1 h. 21 m. p. m. *and to end at* 3 h. 30 m. 3 *″. The Sun's Diameter was obſcured ſomewhat more than* 5 *Digits.*

III. *De Particulis & Structurâ Adamantum. Epiſtola Domini* Antonii Leeuwenhoek, *R. S. Soc. ad* Jacobum Jurin, *M. D. R. S. Secret.*

POſtquam inveſtigando compereram Metalla quædam, & ipſas etiam Arenas ex perexiguis ejuſdem materiæ particulis compoſitas eſſe, meditationem meam converti ad Adamantem; ſcilicet num ille etiam ex iſtiuſmodi conſtet particulis, quæ quidem ope microſcopii conſpici poſſint.

Igitur exiguum quendam Adamantem per microſcopium contemplatus, in eâ Adamantis parte quæ polita non erat, & ſplendore carebat, complures particulas oculis obſervavi; & Adamantem ex parvis particulis compoſitum eſſe comperi. Verum cum hæc nondum mihi ſatisfacerent; Adamantem in fruſta confringere decrevi, ut illum in fragmentis ſuis conſiderarem.

Ergo Adamantem, malleo impoſitum, alio malleo ſemel iterumque percuſſi, qui ſic percuſſus in quatuor aut quinque fruſta diſſiliebat. Quod cum nondum mihi ſatisfaceret, & Adamantem in exiguiſſimas miculas comminuere vellem; fruſtum, quod cæteris majus

erat, duplici chartâ circumvolvi, ne quæ Adamantis miculæ diſſiliendo perirent.

Hic ego duritiem Adamantis admiratus ſum: qui multâ vi aliquoties ictus, in quatuor tantum aut quinque fruſta ſine ullis miculis diſſiliebat—

Poſteriora iſta Adamantis fruſtula microſcopio etiam admovi: quæ cum perſpecularer, pene omnia ex minutiſſimis particulis compoſita eſſe comperi. Cum autem fruſtula illa radiis ſolaribus objicerem: quandam quaſi flammulam ex iis emicare videbam, & quidem majorem, quam unquam vidiſſem.

Fruſtulum unum oculis notabam, quod locum fracturæ ſuæ, planæ quidem ac quadratæ, ſoli directe oppoſitum habebat: qui locus, quantum viſu dijudicabam, tribus aut quatuor pilis menti virilis latitudine reſpondebat.

Ex hoc Adamantis fruſtulo tanta aſcendebat copia ardeſcentium flammularum, ut plures eſſe numero quam quadringentas judicarem. Flammularum iſtarum nonnullæ, ſed numero paucæ, ſibi erant vicinius junctæ, & reliquis majores: unde concludebam, ipſas Adamantis particulas illic etiam aliis particulis majores eſſe, vel ordinatius eſſe diſpoſitas.

Exinde oculos converti ad aliud Adamantis fruſtulum, paris circiter magnitudinis cum priori, quod radios ſolares itidem directe excipiebat; & haud paucioribus exiguiſſimæ molis particulis conſtare comperiebam. Ex unâ fruſtuli illius parte eâque circiter dimidiatâ, ſpecies illæ ardeſcentium flammularum etiam exoriebantur, ſed mole minores: in altera medietate flammula quædam cernebatur, aſſidue ſe mobilitans, cum continuâ quadam coruſcatione, quæ ſpeciem habebat debilioris fulgetri.

Cæterum, poſtquam iſta Adamantis fruſtula radiis ſolaribus ſubduxeram, adhuc multiformes rerum ſpecies

cies oculis meis objiciebantur. Inter alia, ex ſingulis Adamantis particulis flammula quædam in altum emicare videbatur.

Porro, novem præterea Adamantis fruſtula microſcopio applicata habebam: & in eorum ſeptem particulas illas agnovi, quas ſpeciem flammularum ejaculari dixi. In duobus aliis etiam particulas illas agnoſcere poteram, ex quibus Adamantem compoſitum eſſe ſtatui: ſed illæ planitiem ſuam ita ſoli obverſam habebant, ut plures eodem tempore particulas dignoſcerem.

Mihi autem peramænum erat ſpectaculum, tot intueri imagines flammularum, quæ omnes colorem præferebant coruſcum, & pleræque viridantem. Iſtud autem inſolens mihi viſum eſt, quod ad flammularum quarundam extremitatem talis perciperetur in aere motus ac vibratio; tamquam ſi flammula adeo illic debilitata foret, ut conſpicua eſſe deſineret. Præ cæteris autem admirabar, quod ex tali Adamantis particulâ circumquaque ignis exiret, debiliter rutilans, ſicuti cum fulmen e longinquo coruſcare videmus. Quod quidem tam crebro intuente me accidebat, ut oculos avertere non poſſem, niſi jam fatigatos.

Verum tam jucundo ſpectaculo ſæpius frui decrevi, & fruſtulum iſtud Adamantis, donec ſponte a vitro decidat, microſcopio applicatum relinquere. Neque enim ope glutinoſæ alicujus materiæ affixum eſt vitro: niſi quod vitrum, antequam illi fruſtum Adamantis affigerem, humore anhelitus mei irroraſſem.

Cum tam grato ſpectaculo ſolus frui non vellem; quæ modo relata ſunt, legenda tradidi cuidam N. cui & microſcopium in manus tradidi. Cumque poſt aliquantum moræ requirerem; nonne omnia deſcriptioni meæ convenire comperiret; ille prorſus convenire reſpondit, & admirationem ſuum ſuper ſpectaculi inſolentiâ confeſſus eſt.

Porro,

Porro, cum fruſtulum quoddam Adamantis adhuc microſcopio applicatum eſſet, cujus particulas, lamellarum modo ſibi incumbentes, viſu dignoſcere poteram ; haud abs re me facturum putavi, ſi lamellas iſtas delineari curarem, quæ hic in icone 1 denotantur per A B C.

Deinde & aliud Adamantis fragmentum microſcopio applicaveram, cujus lamellæ, invicem ſuperſtratæ, ſeſe oculis meis diſtinctiſſime offerebant ; quæ hic in icone 2 deſignantur per D E F G H I K L M. In hac autem figurâ particulæ illæ ſive lamellæ, quæ per F G, F H, F I, F K, & L denotatæ ſunt, reliquis aliquanto craſſiores eſſe videntur : verum iſtæ particulæ ex pluribus lamellis, invicem ſuperſtratis, ſunt compoſitæ. In iſtâ vero fragmenti parte, quam inter D E F M exprimendam curavi, diſtinctiſſime apparent tenuiſſimæ lamellæ, ex quarum congerie totum Adamantem concretum eſſe pro certo habendum eſt.

Priuſquam ſecundam iconem in chartâ exprimendam curaveram ; forte celebris Gemmarius, *N. Verbrugge*, ædes meas præteribat, quem ego ad conviſendum Adamantis fragmen, ſicut microſcopio applicatum erat, invitavi. Ille fragmen iſtud non ſine admiratione contemplatus, quaſdam ſe Adamantum glebulas, quæ ſibi inutiles eſſent, mihi miſſurum recepit.

Nec multo poſt bina mihi mittit Adamantum fragmenta : item exiguum Adamantem, ex arte quidem politum, ſed ſordidum, uti vocant, ſeu vitioſum.

Cum ſingula ſingulis microſcopiis applicaſſem, primo fragmentum iſtud, quod in *Fig.* 3. per N O P Q R denotatum eſt, delineandum curavi. Lineolæ, quæ per totum hoc fragmentum excurrunt, revera non ſunt niſi lamellæ, ex quibus Adamantes conſtare modo dixi : & apertius conſpiciendas ſe præbent ad P Q.

Ceterum

Cæterum ut eorum, quæ de hâc Adamantis glebulâ, ſive fruſtulo, jam dixi, clarior atque diſtinctior ſit perceptio; fruſtulum iſtud eâdem prorſus magnitudine exprimi juſſi, quam nudo delineatoris oculo, ſine microſcopii ope, offerebat: quæ vera fruſtuli magnitudo, in icone 4, exhibetur inter S T. Iſtud autem tantillum fruſtulum ex tam multis tamque exiguis particulis compoſitum eſt; ut qui non viderit, capere haud poſſit.

In altero Adamantis fragmento, quod ejuſdem propemodum magnitudinis erat, lamellæ dignoſci poterant: & pars illius circiter quinta conſtabat quinquangulo tam polito, tamquam ſi ex arte lævigatum fuiſſet, niſi quod illi affixus eſſet perexiguus Adamas, qui circiter quartam quinquanguli partem obtegebat; & uti clare viſu agnoſcebam, etiam ex lamellis, ſive particulis lamellarum formam habentibus, concretus erat.

Quantum ad perexiguum iſtum Adamantem; illum quidem ex arte politum, ſed ſordidum ſeu vitioſum eſſe dixi: ſordidos enim vocamus, dum vel ſubflavi ſunt, vel rimis aut lineolis deformes: quamvis nonnullæ hujus Adamantis rimæ atque lineolæ nudis oculis conſpici non poſſent; imo, adhibito etiam microſcopio, viſum pene effugerent.

Exiguus hic Adamas erat quadrangulus: prope unum iſtorum angulorum, intra ipſum Adamantem, varias vidi particulas ab invicem ſejunctas; niſi quod aliquantulum ſeſe attingere viderentur, quod initio inſolens mihi viſum eſt. Particularum iſtarum maxima coloris erat ſubflavi, & altero circiter latior quam craſſior: nec ſplendore cedebat vitro. Reliquis particulis variæ erant figuræ; nonnullis etiam par ſplendor ac primæ: nec pauciores eſſe judicabam quam viginti; licet delineator tantum numerum non expreſſerit.

Iſte conſpectus hanc mihi perſuaſionem induxit; quo tempore materia, Adamantum productrix, vagabatur in aëre; exiguas illas particulas, quæ itidem Adamantes erant, priori quem dixi Adamanti adjacuiſſe: materiam autem adamantinam, quamdiu talis materia aëri inſedit, iſtam Adamantum congeriem paulatim circumveſtiiſſe, & minores Adamantes incluſiſſe majori.

Qua occaſione recordor complures me habuiſſe Cryſtallos montanas figuræ ſexangulæ: in quarum nonnullis quaſi incluſæ jacebant figuræ quædam perexiguæ & oblongæ, coloris ſubcœrulei; ſed tam exiles ut, adhibito etiam optimæ notæ microſcopio, vix agnoſci poſſent.

Porro iſtius Adamantis, quem vitioſum appellavi, veram magnitudinem delineari curavi: quam in icone 5 expreſſam habes inter V & W.

Deinde & perexiguos iſtos Adamantes, qui in majorem Adamantem incluſi exhibentur in icone 5, ſeorſum delineandos curavi; quos in icone 6 deſignatos vides per XYZABC. Ubi per XYZ denotatur exterius Adamantis latus, quod licet ex arte politum, ope tamen microſcopii conſpectum, colorem tam fuſcum præferebat.

Per ZABCDE iſti denotantur exiliſſimi Adamantes; quos in majuſculo Adamante velut incluſos latuiſſe præmonui.

Cum poſtea latus Adamantis in icone 5 expreſſi, cui longe minores Adamantes incluſos fuiſſe mox dicebam, ad microſcopium admoviſſem, Adamantem iſtum variis foraminibus pertuſum eſſe comperi; quæ ego foramina tunc facta eſſe cenſui, quando latus illud poliebatur. Ita nimirum ut exiguiſſimi, quos dixi, Adamantes loca illa prius inſederint, ſed poliendo delapſi foramina illa ſive puteolos produxerint, quæ foramina in icone 5 conſpicua ſunt inter FGH.

Porro

Porro exiguum illum Adamantem, inter V W in icone 5 expreſſum, in latus ſuum verteram; & ubi craſſiuſculus erat, novaculum illi aptaveram, ut Adamantem ipſum ictu mallei diffinderem: quod tamen, licet iterato tentanti, non ſucceſſit.

Quare Adamantem chartâ mundâ circumvolutum, imponebam malleo; & alio malleo, crebrius tamen feriendo, diffregi. Poſtquam omnes diffracti Adamantis glebulas diverſis microſcopiis applicaveram; unam, quæ plures qam reliquæ lamellas oculis exhibere videbatur, delineatori effingendam tradidi, quæ in icone 8 denotatur per I K L M. Haud tamen poſſibile delineatori fuit eâdem perfectione glebulam illam exprimere, quâ ſeſe oculis conſpiciendam offerebat.

Cum autem microſcopium, cui fruſtulum illud iconis 8 applicatum erat, diverſum eſſet ab iis microſcopiis, quorum ope alia Adamantis fruſta delineari curaveram; Delineator poſtremum hoc fruſtulum eâ magnitudine expreſſit, quam ſine microſcopio conſpectum oculis offerebat: quæ vero fruſtuli illius magnitudo in icone 9 exhibetur inter N O.

Quædam ex his Adamentum fragmentis, ope microſcopii conſiderata, jucundos præbebant conſpectus: quos etiam nonnullis, talium rerum ſtudioſis, exhibui. Illis autem jucundiſſimum erat, in uno Adamantis fruſtulo tam multiplices agnoſcere partes: imprimis etiam quod lamellæ, ex quibus Adamantes concreti ſunt, in duobus Adamantum fruſtulis valde diſtincte poſſent internoſci; nempe dum lamellæ iſtæ juxta ductum longitudinis oculis objiciebantur.

Exinde ſtudium meum converti ad examen Cryſtalli cujuſdam montanæ, ſex lateribus præditæ, cujus longitudo circiter reſpondebat latitudini duorum digitorum, craſſitudo vero minori digito.

Cryſtallum iſtam in complura fruſta confregi, & fruſta microſcopiis applicavi; diſquirere volens num & illa ex ſuperſtratis ſibi lamellis compoſita eſſent: quâ ratione Adamantes magnitudinem ſuam adeptos eſſe dixi. Sed, tametſi perquiſitionem iſtam ſæpius iteraverim, ne tantillam quidem lamellam in iis deprehendi. Iſtud autem in Cryſtallis, quas quidem præ manibus habebam, plerumque animadverti, in omnibus earum lateribus, quæ numero ſena erant, tranſverſas protendi lineolas, alias aliis ſitu aliquantulum ſuperiores; tamquam ſi illic, increſcentibus Cryſtallis, ortæ productæque fuiſſent: quâ ſuper re, quantumcumque Cryſtallorum numerum ante conſideraverim, atque confregerim, numquam ipſe mihi ſatisfacere potui.

Delphis in Hollandiâ,
Nov. 20. 1722.

IV. *An Account of an Optical Experiment made before the* Royal Society, *on* Thurſday, Dec. 6th, *and repeated on the* 13th, 1722. *By the Reverend* J. T. Deſaguliers, *L. L. D. F. R. S.*

SIR *Iſaac Newton*, in his Optics, (*B.* 1. *Prop.* 1. *Exp.* 2.) relates an Experiment made with a Card, or Paper, painted red on one half and blue on the other, which being enlighten'd by a Candle, the Image, by the Interpoſition of a *Lens*, is ſo projected on a white Paper, held on the other ſide of the *Lens*, that the Place where the blue half appears diſtinct, (or as the Opticians term it, the diſtinct Baſe of the Image of the blue half) is much nearer to the *Lens* than the Place of the Image of the red half. And this is made apparent

FIG. I

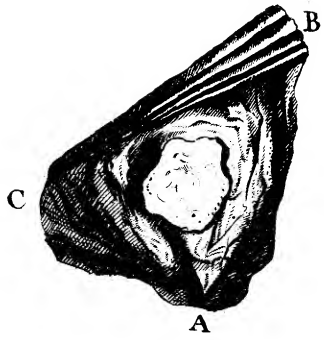

FIG. II.

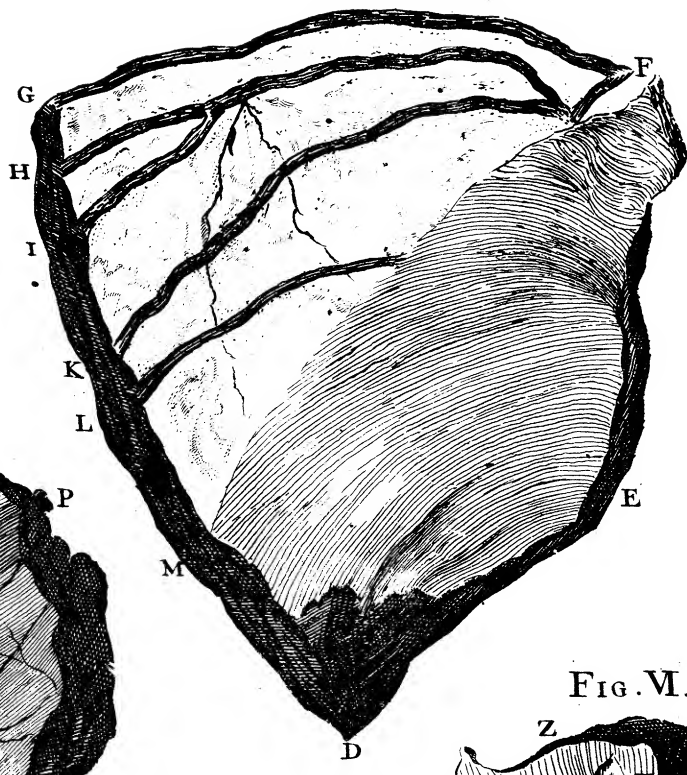

FIG. III.

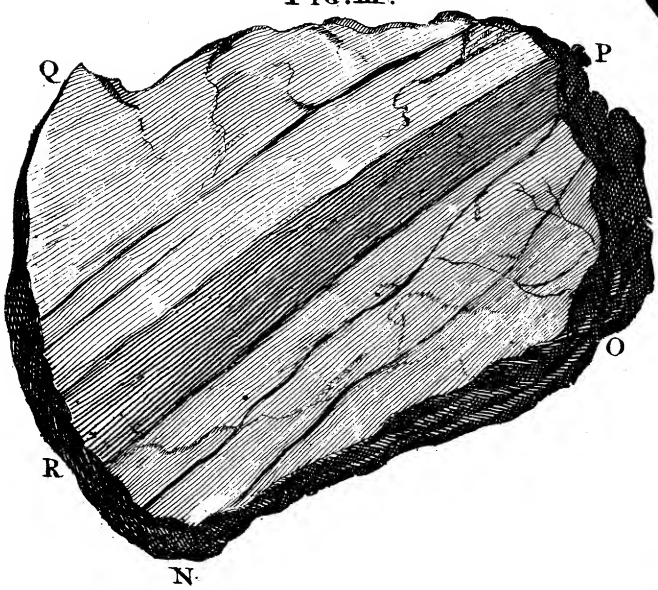

FIG. IV.

FIG. V.

FIG. VI.

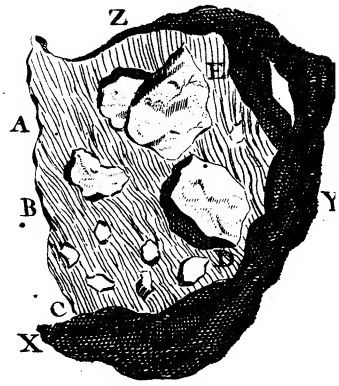

FIG. VII.

Philos. Trans. N° 374.

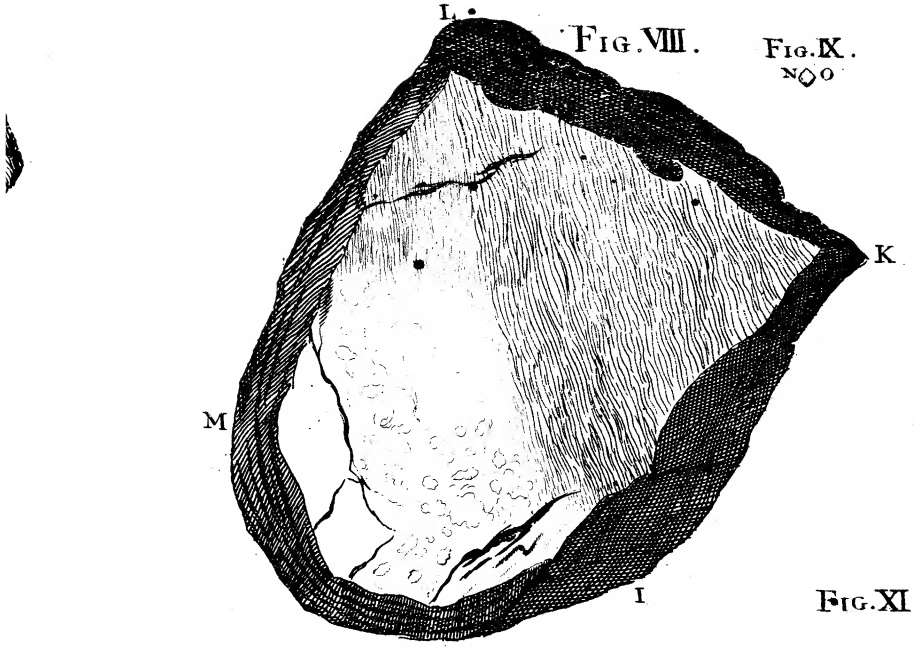

FIG. VIII.

FIG. IX.

FIG. X.
R B

FIG. XI.
R B

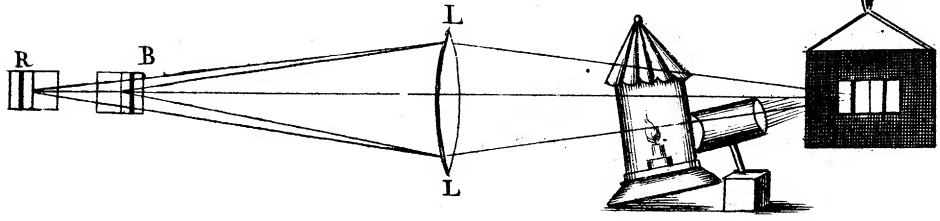

FIG. XII.

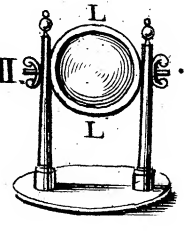

FIG. XIII.

J Sturt sculp.

Philos Trans N° 374

Fig I

Fig II

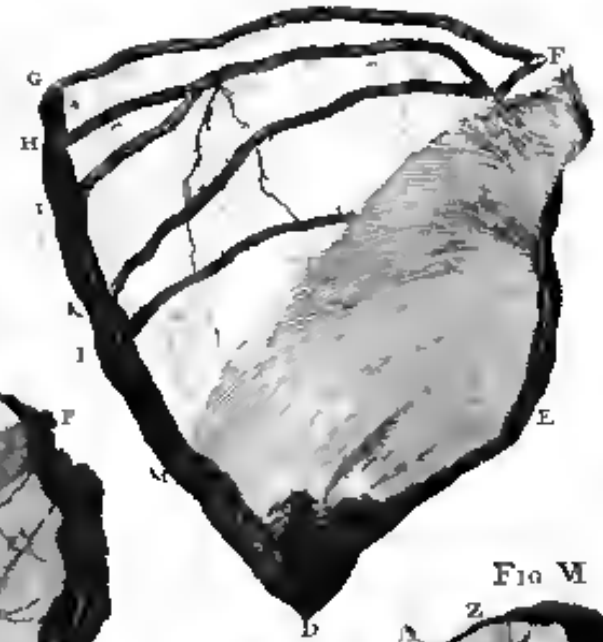

Fig III

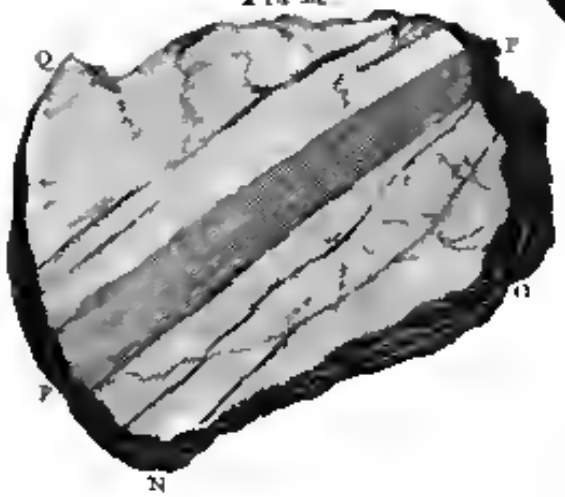

Fig IV

Fig V

Fig VI

Fig VII

Fig VIII

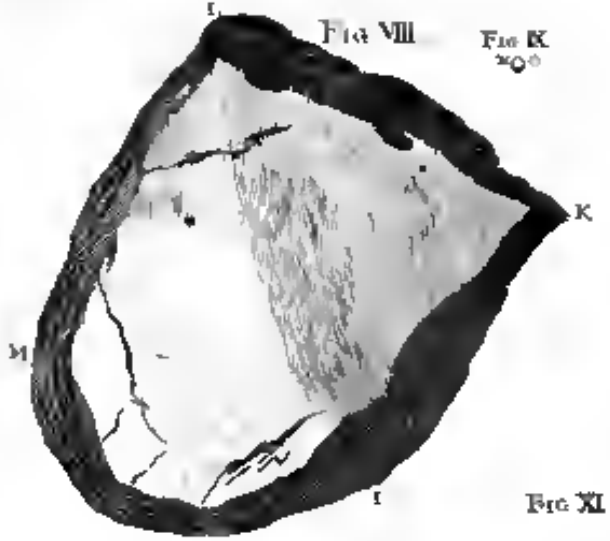

Fig IX

Fig X

Fig XI

Fig XII

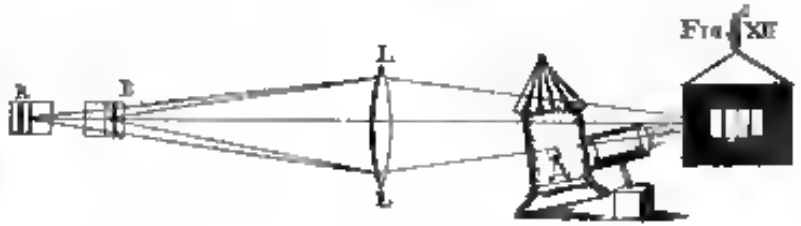

Fig XIII

J Basire fculp